THE HONORABLE THOMAS S. ZILLY

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON AT SEATTLE

UNITED STATES, in its own right and on behalf of the Lummi Nation, Plaintiff, LUMMI NATION, Plaintiff-Intervenor, v. STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY, et al., Defendants.	NO. C01-0047Z **JOINT MOTION TO APPROVE SETTLEMENT AND ENTER PROPOSED JUDGMENT AND ORDER** **NOTE ON MOTION CALENDAR*:* NOVEMBER 24, 2006**

I. INTRODUCTION

The undersigned counsel and parties of record ("Settling Parties") move the Court to approve the attached Settlement Agreement ("Settlement") and enter the attached Judgment and Order. The Settlement is the result of mediation efforts initiated in July 2005

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under Court Order. Dkt. No. 796.[1] The Settlement should be approved for the following reasons:

1. The Settlement is fair, adequate, and reasonable, considering all of the circumstances surrounding the Settlement and all of the consideration provided under the Settlement.

2. The ground water allocated as Indian reserved water to the Plaintiffs, and the amount of water allocated to the State of Washington for apportionment among the Defendants, in quantities that protect all existing uses and offer additional water for future development, is reasonable, when assessed in view of the risks of trial for all parties.

3. The proposed Settlement provides the parties numerous important benefits including:

a) a regulatory mechanism that will maximize the ability to withdraw ground water from the limited aquifer supply while protecting it from contamination;

b) a dispute resolution mechanism; and

c) minimization of future conflict over ground water use.

[1] The proposed Settlement is the product of significant compromise and resolves numerous legal and factual matters in dispute. For purposes of settlement only, the Settling Parties agree that the Court could reach certain legal positions and factual conclusions contained in this Motion that would be offered at trial by some of the parties who have been actively engaged in the litigation. No party is bound by these factual assertions, the attached declarations, or points of law if the Settlement is not approved. Some of these factual and legal assertions are contested, and all parties reserve the right to offer contrary evidence or legal arguments at trial.

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4. The Settlement was reached in good faith, with the assistance of a mediator knowledgeable in the field of water rights, in extensive arms length negotiations in which all interests were represented by experienced counsel.

5. The Settlement does not abridge any contractual or legally protected rights of the non-Settling parties, and divides the water between Plaintiffs and Defendants roughly in proportion to their respective percentage of land ownerships. The proposed process for approval of the Settlement provides any objector with standing the opportunity to challenge the reasonableness of the Settlement.

6. The Settlement represents the culmination and agreed resolution of decades of disputes over the water resources of the Lummi Peninsula, and is the first mutually agreed federal water rights settlement in the State of Washington involving the State, the United States and an Indian tribal government.

II. STANDARD OF REVIEW FOR SETTLEMENTS

In *United States v. Oregon*, 913 F.2d 576 (9th Cir. 1990), the Ninth Circuit set forth the standard of review a district court must employ when reviewing a proposed consent decree. The district court "must be satisfied that it is at least fundamentally fair, adequate, and reasonable." *Id*. at 580. Approval of a consent decree is not a decision on the merits. *Id*. Rather, a court's inquiry is "nothing more than an amalgam of delicate balancing, gross approximation and rough justice. The court need only be satisfied that the decree represents a reasonable factual and legal determination." *Id*. at 581 (citations omitted). To conduct its review, a court should limit its proceedings to "whatever is necessary to aid it in reaching an informed, just, and reasoned decision. " *Id*. at 582. A court must "stop short of the detailed and thorough investigation of a trial." *Id*.

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Once the district court is satisfied that the consent decree was the product of good faith, arms length negotiations, a negotiated decree is "presumptively valid," and parties filing objections to the proposed consent decree "have a heavy burden of demonstrating that the decree is unreasonable." *Id*. at 581.

III. STATEMENT OF BACKGROUND SETTLEMENT FACTS

This Court should evaluate the reasonableness of the Settlement in the light of the following:

There is evidence from which the Court could conclude that the maximum theoretical safe yield of the case area aquifer is 900 acre feet per year ("afy"). Knapp Declaration, Exhibits 1 and 3. The actual safe yield of the aquifer, whether more or less than 900 afy, is not known with certainty and is an issue in dispute. For purposes of settlement, the Settling Parties agree that the maximum theoretical safe yield is 900 afy. The actual safe yield may be less than the theoretical maximum, depending on how the aquifer is regulated, where wells are located, the rates at which various wells are pumped and other factors. Knapp Dec., Exhibit 3. There is insufficient potable water available from the aquifer to meet the future needs of every landowner within the Case Area; the aquifer is susceptible to contamination through saltwater if over-pumped or insufficiently regulated. *Id.* The damaging effects of salt water intrusion can be long term and often irreversible. Knapp Dec., Exhibit 1. In order to maximize the potential yield of the aquifer so that ground water can be made available to the greatest number of land owners, uniform regulation that addresses well spacing, withdrawal limits, well location, chloride levels, monitoring, and other cohesive water management techniques is necessary. No single governmental entity currently has unchallenged authority to regulate all well drilling and all well operation within

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the case area. The Settlement provides for a co-operative regulatory scheme covering these management techniques.

There are 6286 acres of land in the Case Area. Ann Stark Declaration. According to Whatcom County Assessor's data, approximately 1245 acres (20% of the Case Area) are currently owned in fee by non-Indian Defendants. *Id*. The remaining 80% of the land is currently owned in a mixture of trust, restricted fee and unrestricted fee status by the Lummi Nation, Lummi members, or other Indians for whom the United States exercises a trust responsibility.[2] *Id*.

Lummi's water service agreements, the settlements previously entered into by the United States and Lummi with certain Defendants, and the Settlement, taken together, provide approximately 241 afy of water to Defendants in this case. 26 afy of that total is provided to unrestricted fee parcels currently owned by Lummi-member Defendants who use water on those lands. Approximately 95 afy is committed to non-Lummi Defendants under prior settlements or service agreements.[3] Under the current Settlement, the Washington State

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[2] In order to facilitate a less complicated legal description of the Case Area, the Settling Parties, for purposes of settlement, agreed to modify the northern boundary of the Case Area to conform to existing parcel boundaries. This change added approximately 113 acres to the Case Area. The added land is Indian land held in trust by the United States; thus, no additional defendants had to be added to the action. One small triangle of land, approximately 2.5 acres, owned by a non-Indian, was removed from the Case Area with the consent of the owner. The triangular fragment is a small portion of a much larger parcel that was clearly outside of the Case Area. Excluding the fragment allows for a less complex legal description. The acreage and ownership figures presented in this brief reflect the original Case Area boundaries, not the modified boundary.

[3] A number of these agreements have been the subject of Consent Orders approved by the Court during the pendency of this litigation. Existing customers of the Lummi Tribal Water system are explicitly protected under the Settlement, section III.B.2, regardless of whether they have signed a settlement.

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Department of Ecology ("Ecology") is allocated an additional 120 afy.[4] Therefore, the settlements provide 215 afy to non-Lummi Defendants. This total represents approximately 24% of the maximum theoretical safe yield, an amount greater than the approximately 20% of the land base owned by the non-member Defendants.[5]

A reasonable quantity of water necessary to support one single family home in the case area is 0.39 acre feet per year, or an average of 350 gallons per day, which is the level the Settlement provides for each home. Thus, the theoretical maximum safe yield of 900 afy will support at most 2307 single family homes, assuming there are no other uses of water, or one house for every 2.7 acres of land within the Case Area.[6] The majority of the non-Indian homes in the Case Area are located on parcels smaller than 2.7 acres, Stark Dec., which means that an allocation of water based strictly on land area was not a feasible settlement solution. In addition, many Defendant land owners hold state law based water rights that were not created based on land area, and which the parties desired to protect in the Settlement. The aquifer simply is too small to support a household on every parcel of land within the Case Area. As described below, the Settlement protects all existing water uses and provides both Lummi and the State additional water to allocate for future growth.

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[4] The amount allocated to Ecology includes existing vested rights to water under state law held by the individual Defendants or the water association Defendants.

[5] The numbers presented in this Motion represent more precise data than the rough estimates provided to the Court during the July 25, 2006 Status Conference.

[6] 900 afy divided by 0.39 afy/ home equals 2307 homes. 6286 acres divided by 2307 homes equals one home for every 2.7 acres.

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IV. ARGUMENT IN SUPPORT OF MOTION

A. The Proposed Settlement Is Equitable Considering All of the Circumstances And Provides Significant Benefits to All Parties That Could Not Be Achieved Through Litigation.

A brief description of the Settlement and its benefits follows. There are three major components of the Settlement: division of water, management of the aquifer and of water users, and dispute resolution.

1. The Division of Ground Water in This Case Is Fair, Equitable, and Reasonable.

The agreement provides for the limited supply of groundwater to be allocated to both the Plaintiffs[7] and the State of Washington (Ecology), with Ecology then dividing its allocation among the defendant property owners, consistent with their rights under state law. In addition, prior settlements and other water service agreements that Lummi has negotiated with defendant property owners are preserved.

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[7] Plaintiffs include the Lummi Nation and the United States acting for the benefit of the Nation and individual Indians for whom the United States owns land in trust or restricted fee status. At the July status conference, the Court inquired why individual Indians owning lands in restricted fee status were not named as parties in this lawsuit. The United States brought this case, in part, on behalf of these Indian owners. The law is well established that the United States' trust relationship applies not only to lands expressly held in trust for the benefit of Indians, but also to lands owned in "restricted fee" status (lands owned in fee, but subject to federal restraints on alienation). *Heckman v. United States*, 224 U.S. 413, 446 (1912); *Minnesota v. United States*, 305 U.S. 382, 388 (1938); *United States v. City of Tacoma*, 332 F.3d 574, 579 (9th Cir. 2003). Thus, Indians owning land in restricted fee are not named parties in this lawsuit, as the United States has the authority to bring this action on their behalf, without their presence. *Heckman*, 224 U.S. at 444. Any decree entered by this Court will, as a matter of law, bind both the United States, as trustee, and Indians owning lands in "restricted" fee. *Heckman* at 434-35 ("if the United States, representing the owners of restricted lands, is entitled to bring a suit of this character, it must follow that the decree will bind not only the United States, but the Indians whom it represents in the litigation"). Indian owners of **unrestricted** fee lands are named as defendants, pursuant to the Court's Order of April 5, 2002.

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The allocation of ground water to Defendants under the proposed Settlement is more definite and certain than may have resulted from a trial. Significantly, in contrast to long-standing Washington water law principles that would otherwise protect senior rights holders in water-scarce situations, the Defendants gain an immeasurable benefit through settlement because they will not be subject to curtailment or loss of water through exercise of senior federal reserved rights by the Plaintiffs.

2. The Division of Ground Water Between Plaintiffs and Defendants Results In a Distribution of Water Roughly Comparable to Indian and Non-Indian Land Ownership Within the Case Area and Provides Opportunities for Additional Growth and Development of Water By the Parties.

As a result of the division of water, every existing home in the Case Area is provided with water. In addition, a substantial number of defendant landowners, who have no water rights because they never used water on their land[8], have the opportunity to acquire a ground water right from the state and build a home on their land: the water associations are able to provide additional water service to approximately 50 new homes under state water right certificates that have not been fully utilized in the past and the owners of approximately another 60 parcels will be able to develop wells and build houses in the future. Under the

[8] In Washington, water rights are acquired only by actual use. "Subject to existing rights all waters within the state belong to the public, and any right thereto, or to the use thereof, shall be hereafter acquired **only by appropriation** for a beneficial use and in the manner provided and not otherwise. . . ." RCW 90.03.010. (Emphasis added). This principle applies to ground water. RCW 90.44.040. "Appropriative rights are the opposite of riparian rights; they do not depend on land ownership but on the application of water to a beneficial use and **thus they are separate from land ownership."** Tarlock, *Law of Water Rights and Resources*, 1989, p. 5-33 (emphasis added). "In the West water and land are separate and ownership of land does not automatically give right to water use." *Yellen v. Hickel*, 335 F. Supp. 200, 205 (S.D. Cal. 1971).

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Settlement, the Plaintiffs also retain a supply of ground water that will support some of Lummi's growing population.

The division of water under the proposed Settlement is roughly proportional to Lummi and non-Lummi land ownership (approximately 24% of the water for use by non-Lummi Defendants on approximately 20% of the lands) and, importantly, allocates the risk of shortfall to Plaintiffs. Under the Settlement, the Department of Ecology is allocated 120 acre-feet per year (afy) of ground water.[9] In addition, the existing water rights settlements and service arrangements with non-Lummi water users are preserved, representing another approximately 95 afy of water.

Under the Settlement, the Plaintiffs take the risk that the safe yield will not reach the theoretical maximum because the Settlement provides that Ecology's Allocation is a set amount, with Plaintiffs' allocation being based on whatever is left. In combination with Plaintiffs' agreement that they will not exercise their Treaty-priority to curtail water uses by the Defendants, any shortfall in the maximum theoretical safe yield will be Plaintiffs' burden to absorb.

3. The Parties Chose Certainty and Conflict Reduction In Crafting the Settlement.

At the July 2006 status conference, the Court asked why the water was not divided based on a percentage of the actual production of the aquifer. In the negotiations, the parties considered a percentage division of the water based on actual productivity of the aquifer, but ultimately they concluded that, because the productivity of the aquifer was not absolutely

[9] State procedures determine how water is allocated among the Defendants.

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guaranteed, a set amount better met the needs of all the parties. The primary reason is that all parties consider certainty and conflict avoidance to be central goals of the Settlement.

If allocations are tied to the actual production from the aquifer, it will be impossible to know what the total allocations will be until the aquifer is fully exploited. The parties are unlikely to use up their respective allocations at the same rate. If the aquifer fails to produce the theoretical maximum, one party may exceed its entitlement before the other party reaches its entitlement. Existing uses may then have to be curtailed or terminated. In resisting those remedies, affected persons undoubtedly will challenge the conclusion that the aquifer limits have been reached, which, in turn, will mean more litigation and conflict.

The Settling Defendants feel they are likely to reach their allocation limit before the Plaintiffs reach theirs, and before the actual production of the aquifer is known. They run the risk that actual uses (homes built in reliance on the Settlement) will have to be terminated if the aquifer fails to perform as predicted. They prefer the certainty of a set allocation to the chance they might receive more water under a percentage allocation. The Plaintiffs, in turn, prefer to know the size of the Defendants' demand on the aquifer, so they can plan their future water system accordingly. All parties desire an end to conflict. The set allocation accomplishes those goals.

4. Defendants' Settlement Allocation Is Fair and Reasonable in Light of the Potential Risks of Trial.

Assuming the maximum safe yield is 900 afy, the division of water in the proposed Settlement could provide more water to the non-Lummi Defendants than potentially may result from application of the Court's June 2005 quantification order. Applying the practicably irrigable acreage ("PIA") and diligence rulings from the June 2005 Order, and accepting the state's PIA evidence of arable lands for purposes of this argument, the parties

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acknowledge that the Court could award as much as 588 afy to the Plaintiffs under the PIA quantification methodology for 359 acres of arable land. This amount is approximately 66% of the maximum theoretical safe yield of 900 afy and leaves, at most, 312 afy for other uses.

The Court's Order further declared that the Plaintiffs will also receive a domestic quantification. Although the Court's Order provides no specific guidance as to how the domestic water needs would be quantified, if the Court used a land-based method of quantification of the domestic right, it is significant that the Nation and its members own more than three-quarters of the Case Area lands; thus, it is possible that, at trial, non-members could receive less than 100 afy (one-quarter of 312 afy is 78 afy). If the Court used a population-based approach to quantify the tribal domestic needs, the existing Lummi population is roughly twice that of the non-Lummi population (as recited in the June 2005 Order, using 1990 census data, the Indian population was 1,256; the non-Indian population was 661). Without even applying any factor to accommodate future Lummi population growth in the reserved rights award, the bulk of the remaining 312 afy of ground water could be awarded to the Plaintiffs under a population-based assessment.

Given the inherent uncertainties of trial, the proposed Settlement allocation is reasonable. When considered in combination with the Plaintiffs' agreement not to exercise a senior call on that water, discussed below, the negotiated resolution of this case provides important benefits to Defendants, as well as certainty to all parties.

5. Defendants Receive An Additional Benefit in Settlement by Plaintiffs' Agreement Not to Enforce the Senior Priority of their Treaty Reserved Water Rights.

In a major concession in support of Settlement, Plaintiffs agree that the water rights held by the Defendants, to the extent they are junior to the Plaintiffs' rights, will not be

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subject to curtailment or loss under the prior appropriation seniority system. The proposed Settlement avoids conflict between senior and junior water rights holders, and further alleviates the need for long and protracted litigation to determine the priority dates associated with individual parcels of land. Under long-established water law, and pursuant to this Court's June 2005 Order, it is unlikely that many Defendants would be successful proving at trial an entitlement to share in the Plaintiffs' Treaty-based reserved rights priority. Most water-using Defendants would be entitled, at most, to a junior state-law based water right. Under the agreement the amount allocated to Ecology "shall not be subject to reduction in event of shortage, including under the prior appropriation doctrine or based on federal reserved rights." Agreement, p. 5. This provision is in sharp contrast with Washington prior appropriation law that requires junior appropriators to cut back their water use to satisfy water rights entitlements of senior rights holders.[10] *Longmire v. Smith*, 26 Wash. 439, 447, 67 P. 246 (1901). In a water-scarce environment, this benefit of settlement cannot be overstated. Even for those Defendants who have never put water to use and therefore have no water right under state law, should they acquire in the future a right from Ecology under the Settlement, they also receive the same benefit of Plaintiffs' agreement not to enforce seniority. This is a result that could not be achieved at trial and eliminates a major source of potential conflict should shortages arise in the future.

6. The Benefits Provided to the Plaintiffs Are Fair and Reasonable.

The Plaintiffs also receive substantial benefits from the Settlement. The amount of water received by the Plaintiffs is fair and reasonable, even though the exact amount is not

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[10] As among the defendant property owners sharing in the water that is allocated by Ecology, state law seniority and diligent use principles will still be applied by the state.

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set with certainty, and even though a trial may have produced a larger entitlement. In exchange for their agreement not to assert priority calls, the Plaintiffs know exactly the size of the non-Indian demand on the aquifer, and where that demand will occur. The Plaintiffs can plan for their future needs without concern that "exempt wells" will continue to proliferate and be drilled at random locations without advance authorization from any government agency. Because the Lummi Nation is not yet using as large a percentage of its water allocation as are the Defendants, and because Lummi operates a municipal water system rather than relying on individual property owners to make ground water development decisions, Lummi has more time and flexibility in planning for future growth. The Plaintiffs' ground water allocation under the Settlement allows the Nation to serve, over time, its growing population. The regulatory controls on pumping and chloride concentrations in the Settlement provide the Nation an opportunity to optimize ground water use from the aquifer. Because the Plaintiffs' allocation is not a fixed number but instead is based on what remains over and above the Defendants' allocation, the Nation will benefit from maximization of the aquifer's ground water production. The Defendants' well locations are dictated primarily by where they happen to own property. The Plaintiffs, with a much larger land base and a government that has taken responsibility to provide water to all its members through a municipal system, can locate wells to maximize aquifer yield while accommodating the known locations of the Defendants' wells. The Plaintiffs consider this to be a substantial benefit.

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7. The Settlement Provides for Joint Management of the Aquifer, A Result Which Likely Could Not be Achieved at Trial and Is Certain to Reduce Future Conflict Among the Parties.

Of significant advantage to all parties, the joint management scheme provided in the Settlement will minimize future jurisdictional conflicts among the parties. Under the agreement, no well can be drilled or used in the Case Area without the permission of either Lummi, the United States, or Ecology. The ground water aquifer will be jointly managed by Lummi and Ecology under an agreed set of technical requirements, developed by technical representatives of the three governments, which include maximum allowable chloride concentrations and maximum withdrawal quantity limits, based in part on the chloride limits. All wells will be metered. Chloride concentrations will be measured in each well at least annually with the goal of detecting and controlling salt water intrusion. All data from all wells will be shared. These regulatory agreements provide important protections for the health and integrity of the ground water aquifer and, therefore, for the ability of the parties to access ground water now and in the future.

The chloride limits agreed upon in the Settlement provide important protections to the aquifer so that it can sustain future growth. In the event a non-Indian well exceeds the agreed chloride limits, under the Settlement Agreement, Lummi will provide water to that home from the tribe's municipal system. The Defendants' wells, and most of their lands, are located along or near the shoreline of the Lummi peninsula. As a result, saltwater intrusion may show up in their wells sooner than in wells located farther inland. Under the Settlement, Lummi agrees to accept non-Indian well owners onto the Lummi water system if their wells become inoperable due to unacceptable chloride levels, regardless of the cause. This represents a substantial protection for non-Indian property owners that could not be

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achieved at trial, while also allowing Lummi (and others) to depend on the health of the aquifer to meet future needs.

8. The Settlement Provides An Agreed Dispute Resolution Mechanism to the Parties.

Another benefit of the Settlement is agreement among the parties about a future dispute resolution process. Any disputes that arise under the Settlement will be resolved by a Court appointed Water Master, who will be funded by the parties who receive water under the Agreement. Not only does the Settlement end the current litigation, it greatly reduces the likelihood of future litigation. If conflicts do arise, the Agreement provides for expedited resolution in a forum accessible to all affected parties. Difficult issues of sovereign immunity of the State, the United States and the Lummi Nation are avoided, assuring that disputes will be decided expeditiously and on the merits.

In addition, if the Water Master concludes that either Lummi or Ecology has failed to perform required regulatory functions, the Water Master may step in and perform those functions at the expense of the defaulting party. This agreement will reduce the likelihood of future jurisdictional conflicts, to the benefit of all the parties.

B. The Proposed Settlement Represents Reasonable Compromises Negotiated by the Parties in Good Faith, Provides Access to Additional Water to Many Defendants Who Otherwise Have No Legally Protected Water Interest, and Will End Decades-old Conflict Over Water Use.

1. The Settlement Was The Product of Extensive, Arms-Length Negotiations.

For almost a year, with the assistance of a mediator appointed by the Court, the Settling Parties conducted extensive negotiations to resolve the issues raised by the litigation. The Court's order sending this case into mediation went to all parties who had

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entered appearances in the case. Information about the negotiation sessions was disseminated to the parties through Court filings and Ecology's website. These mediated negotiations occurred in good faith over many months. The parties had an opportunity to participate, and represented parties, counsel, and many pro se parties in fact did participate. These negotiation meetings culminated in a written agreement on principles of settlement signed by counsel for the represented parties and a number of pro se parties on October 22, 2005.

Following these long basic negotiation sessions, some of the signatories spent months of effort involving detailed drafting, revision and negotiation of many details not expressly addressed in the October 2005 agreement in principle. The final Settlement, which the Settling Parties ask the Court to approve, reflects the conceptual agreement reached in the larger meetings held during the fall of 2005.[11]

2. The Settlement Does Not Impair Legally Protected Interests.

The Settlement is fair to all parties. The Settlement's water allocation and regulation structure protects the rights of all existing water users and reduces the uncertainty to those current water users and to a significant number of potential future water users.

Water rights litigation inherently deals with supply shortages: where sufficient water is available, conflicts do not arise. Here, the aquifer underlying the Case Area is insufficient to provide water to every land owner and prospective water use: the Case Area aquifer

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[11] The Lummi Nation and the United States made several additional concessions following the agreement in principle reached on October 22, 2005, such as the agreement to allow a non-tribal member to hook up to the tribal water delivery system in the future should that individual's well fail. The Agreement explicitly provides that connection under this provision does not expressly or impliedly constitute a consent to general tribal jurisdiction. Agreement, p. 48.

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cannot supply water to each and every parcel. Importantly, however, under Washington water law, mere land ownership does not provide a guaranteed right to water that has not previously been put to use: it is, indeed, actual beneficial use of water that gives rise to a protected interest.[12]

Through intensive negotiation that involved concessions by various parties and contributions of presently unused "paper" water rights held by certain Defendants, the Settlement provides a set water allocation to Ecology that protects all existing water users and provides additional water for over one hundred landowners who are not presently using water. Thus, while not providing water to every parcel, the compromises reached in settlement provide an allocation to the State that is available to be divided among a large number of Defendants. The Settlement also replaces the state law priority system that requires curtailment of junior uses to protect seniors with an agreement the Plaintiffs will not invoke prior appropriation or reserved rights doctrines in times of water shortage. These are results that could not have been accomplished through litigation.

The Settlement also provides for all wells within the Case Area to be more fully regulated, in order to protect the federal reserved rights of the Plaintiffs.[13] In addition to the exercise of governmental control over drilling of all wells, withdrawals from these wells are carefully monitored under the proposed agreement. These negotiated regulatory principles

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[12] See, e.g. RCW 90.03.010; *DOE v. Grimes*, 121 Wn.2d 459, 468 and 477 (1993). See also text at footnotes 8, *supra*, and 14, *infra*.

[13] The Settlement provides for certain requirements on wells using less than 5.6 acre feet per year of water for domestic purposes that are exempt from formal state permitting requirements. Notwithstanding the permit exemption, water use from these wells is subject to Ecology regulatory authority under state law, including the prior appropriation doctrine, actual beneficial use requirements, measurement and monitoring requirements, and other principles. RCW 90.44.050.

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provide critical protection to all parties because it is only through adequate regulation of well placement, withdrawal amounts, chloride levels and other key management concerns that the limited ground water supply can be made available to the greatest number of beneficiaries. These settlement compromises will achieve both greater certainty and a greater spread of the benefits to more landowners than could have been achieved through trial. These provisions will also reduce future conflict in ways that could not be achieved through trial.

C. Non-Consenting Parties Have An Opportunity to Object to the Settlement.

Through the Judgment and Order, once approved, the Settlement will control all uses of groundwater by all parties in the litigation. Therefore, whether or not those parties have actively engaged in settlement negotiation efforts, all parties will have an opportunity to be heard regarding the reasonableness of the proposed Settlement, and to request a hearing to the extent their legal rights are affected by the Settlement. *See Local Number 93 v. City of Cleveland*, 478 U.S. 501, 525 (1986).

The Settlement divides the aquifer safe yield between the Plaintiffs and the State of Washington. Water is allocated to Plaintiffs, the "Lummi Allocation," as federal Indian reserved water. Uses of federal Indian reserved water are, as a matter of law, subject to the regulation and control of the Lummi Nation and United States and thus subject to the terms and conditions agreed to by the United States and Lummi Nation in the Settlement.

As to the "Ecology Allocation", the Washington Attorney General's Office, representing Ecology, as the regulator of State-based water rights, has the authority to settle this litigation. Ecology has the authority and responsibility to make a determination as to the amount of groundwater available for use on the Case Area under State law, and it has done so in negotiating the Settlement. The responsibility to make this determination is not

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unique to the Settlement. For example, Ecology is required to make a determination of whether water is available for appropriation each time it evaluates a water right application.[14] Consequently, if the Court adopts the proposed Judgment and Order affirming the reasonableness of Ecology's determination in light of the federal reserved rights at issue in this case, all persons seeking to use water on the Case Area pursuant to State law will, as a practical matter, be bound by Ecology's determination, whether such persons are signatories to the Settlement or not.

Ecology also has a responsibility to protect existing water rights when it administers water under state law. See RCW 90.03.290(3) (Ecology must determine that a proposed withdrawal "will not impair existing rights or be detrimental to the public welfare.") In the Settlement, Ecology has agreed to several joint regulatory measures that it believes are essential to protection of both existing state water rights and the federal reserved rights recognized by the Settlement (e.g. that no new use of groundwater is permitted on the Case Area without advance permission by Ecology, through a permit or registration; that all wells be monitored for quantity and quality, etc.). If this case went to trial, the Court would have the authority to require similar measures to protect the federal rights. The Settling Parties have agreed that evidence exists from which the Court could conclude such measures are necessary in order to protect the federal reserved rights of the Plaintiffs. Agreement, p.2. In evaluating the risks of trial and other settlement factors, Ecology, in conjunction with the

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[14] Ecology has a general responsibility in determining whether water is available for appropriation. RCW 90.03.290, made applicable to ground water by RCW 90.44.060. Ecology's evaluation is an exercise of agency discretion. *Hillis v. Department of Ecology*, 131 Wash.2d 373 at 384; *Jensen v. Department of Ecology*, 102 Wash.2d 109, 113 (1984). See also RCW 90.44.130: "…[Ecology] shall have the jurisdiction to limit withdrawals by appropriators of ground water so as to enforce the maintenance of a safe sustaining yield from the ground water body."

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settling Defendants who comprise the vast majority of current state water right users in the Case Area, have concluded that the joint regulatory structure is reasonable and necessary. That conclusion is "fundamentally fair, adequate, and reasonable" *United States v. Oregon*, 913 F.2d at 580. Ecology's allocation and the related procedural determinations, to be confirmed under the proposed Judgment and Order, are properly within the purview of Ecology and the Washington Attorney General in settlement of litigation with the United States where federal rights are involved. *Lawyer v. Justice*, 521 U.S. 567 (1997).

Because not all Defendants have chosen to participate in the negotiation of the Settlement, however, and some parties may object to it, the Settling Parties propose that notice of the proposed Settlement be mailed to every Defendant in the case, regardless of whether the party is in default, has entered an appearance, or has filed an answer to the Amended Complaint.[15] Defendants who have objections to the reasonableness of the Settlement are entitled to have those objections resolved by this Court. Defendants who do not file objections would, as a matter of law, be bound by the Judgment and Order. *United States v. City of Miami*, 664 F.2d 435 (11th Cir. 1981) (an objector to a proposed consent decree has the right to a hearing only on issues which affect it and to which it has raised objections).

The Settling Parties have filed today a Joint Motion to Adopt Special Process for Consideration of Settlement ("Process Motion"). The Process Motion sets forth the proposed notice provisions in more detail, as well as the procedure under which objections to entry of the Judgment and Order would be adjudicated. In summary, the Process Motion asks the Court to alter the normal timing for response to and consideration of this motion,

[15] All parties who have appeared have been served with this Motion and the Settlement.

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and to require any objection to the Settlement or entry of the Judgment to: (1) identify the water right or other legally protected interest asserted by the objector and (2) explain why the proposed Settlement and/or proposed Judgment and Order would injure the alleged water right of the objector or some other legally protected interest.

Once this Court is satisfied that the Settlement is fundamentally fair, adequate, and reasonable in light of the surrounding circumstances, and that the proposed agreement is the product of good-faith, arms-length negotiations, the objecting party bears a "heavy burden of demonstrating that the decree is unreasonable." *United States v. Oregon*, 913 F.2d 576 (9th Cir. 1990). To carry this burden an objector must prove: (1) the object has water rights or other legally protected interests, and (2) the objector's water rights or other legally protected interests are materially injured by the terms of the Settlement and the proposed Judgment and Order; and (3) the objector is not bound by the Settlement terms by virtue of the objector's relationship to a party that has agreed to the terms of the Settlement. See, Arizona procedure cited in the Process Motion, filed today.

Most objections are likely to be ripe for summary disposition, without a need for evidentiary hearings. The vast majority of non-Settling Defendants own vacant, undeveloped lands, and have never put water to beneficial use on such lands. These Defendants have no water rights under either state or federal law, nor any other legally protected interest known to the Settling Parties, that would be affected by the proposed Settlement.[16]

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[16] Federal reserved rights of non-Indian successors to allottees require diligent use. *Colville Confederated Tribes v. Walton*, 647 F.2d 42 (9th Cir. 1981), cert. denied, 454 U.S. 1092. State water rights require actual beneficial use. RCW 90.03.010 and 90.44.040. See footnotes 8,12, and 14, *supra.* In negotiating the Settlement, the Settling Parties have gone to great lengths to identify, list, and protect all persons who have put water to use within the

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Objections which raise issues that are not resolved by summary disposition, will require the Court to schedule an evidentiary hearing to resolve any factual disputes. Ultimately the Court would issue a ruling either (1) concluding that the particular objection has no merit and that entry of the Judgment and Order is appropriate as to that defendant; or (2) concluding that the objection has merit and that entry of the proposed Judgment and Order is not appropriate.

D. The Settlement Reduces Future Conflict; a Trial Will Not.

If this case proceeds to trial, the Court will quantify water rights in the aquifer for the Plaintiffs and set a priority date for those rights that will generally be senior to the rights of most Defendants. That ruling will resolve the current case, but it may only set the stage for future disputes. A judicial determination of how much water an aquifer can safely produce, based on expert opinion at trial, does not guarantee that the aquifer will actually produce that water under future conditions. Despite the determination of rights, localized shortages inevitably will occur in the future, because potable ground water is not distributed evenly throughout the aquifer and the aquifer may not perform exactly as predicted.

When shortages occur, the senior right holder is entitled to demand that the junior user be shut down. The junior may contend that the senior is not entitled to relief due to an alleged inappropriate action by the senior. For example, is the senior's well improperly constructed? Is it too deep, too shallow, too close, pumped at too high a rate? Is the real source of the shortage the actions of a third party, whose rights are even more junior, and who should be shut down first? What is actually occurring under the ground, an issue that may prompt conflicting testimony from retained experts. Is it inequitable to shut down the

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Case Area.

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junior despite the clearly determined senior right? What court can hear these arguments? Does sovereign immunity prevent the tribunal from hearing claims against the state, the tribe, or the federal government?

These are not hypothetical contentions. All of them, and more, have been made over the past forty years on the Lummi Reservation. The parties to the Settlement were fully cognizant of all of these past disputes in their efforts to craft the settlement solutions. Plaintiffs' agreement to forego a priority call and to provide a "safety net" for non-Indian wells that fail, dramatically reduces the chances of future conflict. The Settlement provides security for non-Indian property owners within the case area that an adjudication of water rights could never provide. Similarly, adequate regulation of all wells, and a cooperative regulatory scheme under the supervision of a Water Master, will also assist the parties. A major goal of the Settlement is to avoid future conflicts, or, at worst, to provide an efficient mechanism for resolving them. The Settlement does that. A trial to determine water rights will not do that.

E. Settlement is Contingent Upon Vacatur of the June 2005 Interlocutory Order, and Good Reasons Exist For the Court to Vacate This Prior Order.

The Settlement outlined above provides a unique approach to sharing and regulating the limited Case Area ground water resources. This approach differs in significant respects with the Court's interlocutory orders entered June 23, 2005 (Dkt. 794) and May 20, 2005 (Dkt. 779) (collectively "the Court's June 2005 Order" or "the Court's Order"). While the Parties recognize that the Court's Order did not finally determine any rights of any party and merely served to provide a roadmap to resolving those rights at trial, all of the Settling Parties agree the approach and administration of the Settlement, and the June 2005 Order, are inconsistent. Therefore, pursuant to Fed.R.Civ.P. 54(b), the settling Parties jointly ask

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the Court to vacate those orders and to enter an order specifically declaring that the rulings announced in those orders shall have no preclusive effect on any party to the case. While not every Settling Party has the same concerns with the rulings contained in the June 2005 Order, all of the Settling Parties agree that the Order should be vacated. Because some of the rulings have far-reaching potential consequences, the Parties have been unable to agree to a settlement that retains these rulings while forfeiting appeal rights. Indeed, the Settlement is specifically conditioned on the orders being vacated by the Court, and such vacatur is fully justified in this case to facilitate settlement.

1. Vacatur of the Court's June 2005 Order is Supported by the Procedural Posture of this Case.

The Court's June 2005 Order is interlocutory in nature; it provided important guidance to the parties on certain standards and methods of proof to be applied at trial, but did not finally determine any rights or claims of the parties in the litigation. *See, e.g.*, *Nickert v. Puget Sound Tug & Barge Co.*, 480 F.2d 1039 (9th Cir. 1973). As such, the interlocutory Order is "subject to revision at any time before the entry of judgment adjudicating all the claims and rights and liabilities of all the parties." Fed.R.Civ.P. 54(b).

Where settling parties ask the court to vacate a **final** judgment, the Ninth Circuit requires a district court to balance "the competing values of finality of judgment and right to relitigation of unreviewed disputes." *Ringsby Truck Lines, Inc. v. Western Conference of Teamsters*, 686 F.2d 720, 722 (9th Cir. 1982). In contrast, here, the balancing is unnecessary because: (1) no one will have the right to relitigate the issues resolved by the Settlement since **all** potential claimants are parties to this case; (2) no final judgment is involved; and (3) finality is promoted by the Settlement itself. There exists no procedural bar to vacatur of the June 2005 Order in this case.

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2. Approving the Agreement In Its Entirety Promotes Settlement and Conserves Judicial Resources.

The Ninth Circuit has a strong policy in favor of encouraging settlements which limit expensive litigation. *E.g. Ahern v. Central Pac. Freight Lines, Inc.*, 846 F.2d 47, 48 (9th Cir. 1988). The parties here spent months in intensive mediated settlement negotiations and many additional months of weekly exchanges of drafts, revisions, editing and additional substantive negotiation in order to reach the final Settlement which the attorneys agreed to recommend to their clients. The Settlement will provide finality to the parties and most certainly will reduce future conflict between them, an important result after decades of fighting over the limited ground water supply. The Settlement, however, is conditioned upon the Court vacating its June 2005 Order.

Vacatur will also eliminate the unnecessary potentially problematical precedential value of the Court's summary judgment orders. None of the parties is in complete agreement with all of the rulings in the Court's June 2005 orders and some believe that it will be necessary to appeal certain rulings on the parties' summary judgment motions. If the parties agree to voluntarily terminate this action without vacatur, they will lose the right to seek a remedy for these errors in the Ninth Circuit and may find themselves subject to the Court's ruling in other contexts. While significant to all Settling Parties, this fact has particular implications for the Plaintiffs in light of their view that the Court's decisions in this case have potential adverse implications for Indian tribes and their members across the nation, and could affect the ability of the United States to protect Indians' reserved water rights. In another case where settlement precluded appellate review of a district's ruling on the constitutionality of a state statute, the Northern District of California granted vacatur:

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> The constitutionality of § 647(c) is a significant issue that should not, without good reason, be precluded from appellate review on the merits. This factor weighs equitably in favor of vacatur. . . . . The Court finds that the asserted public interest in the precedential value of ***Blair I*** does not outweigh the State's interest--and the concomitant public interest--in obtaining review of the important constitutional issue of § 647(c)'s constitutionality. . . . Because issues involving freedom of speech under the First Amendment are so important to the public, they should be subject to the normal course of appellate review, not arrested by an unreviewable, mooted district court decision.

Blair v. Shanahan, 919 F.Supp. 1361, 1366-67 (N.D.Cal.1996). This Court should similarly grant vacatur to allow the parties to settle this case, and not be forced to continue litigation solely to preserve the right to seek appellate review of the June 2005 Order.

3. The June 2005 Order Is Inconsistent With Key Provisions of the Proposed Settlement.

The June 2005 Order provided the parties with certain legal principles and methodologies that would guide the course of trial to determine the parties' water rights and use of water but did not actually quantify or determine those rights. Those rulings likely facilitated the parties' individual assessment of their likelihood of success at trial. The proposed Settlement takes a completely unique approach and does not use the Court's Order as the basis for dividing and regulating the ground water resources within the Case Area. The two approaches are fundamentally different.

Among the most prominent examples of inconsistency between the June 2005 Order and the Settlement is the Settlement's elimination of the seniority system as between the Plaintiffs and the Defendant water users in resolving water scarcity issues. The June 2005 Order is premised on seniority, which is a fundamental water rights concept. The Settlement provides that Lummi and the United States will forego a priority call in times of water

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shortage. In fact, Plaintiffs assume the risk of water shortages under the Settlement. Exactly the opposite occurs under the June 2005 Order.

The June Order uses the priority system to further identify the diligence required by non-Lummi successors in interest to allotted lands in order to share in the Treaty priority date. The Order embraces a presumptive fifteen-year period for the exercise of diligent use of water after a non-Indian acquired title from an Indian. Because the Plaintiffs agree to forego their claims to senior water rights under the Settlement, the issue of diligent use of water under the *Walton* line of cases also becomes moot. Parties who had potentially viable *Walton* claims and parties with existing homes who had little or no hope of proving a *Walton* claim are all protected under the proposed Settlement. In addition, a substantial number of parties who have never used water on their parcels have the opportunity to obtain a water right on the same footing as successful *Walton* claimants would have had. Thus, all present rights and many future interests are protected under the Settlement using an approach that differs from the June 2005 Order. Because "a federal court is not necessarily barred from entering a consent decree merely because the decree provides broader relief than the court could have awarded after a trial," *Local Number 93 v. City of Cleveland*, 478 U.S. 501, 525(1986) (Citations omitted), this agreed resolution of the case is appropriate, even though it differs from the Court's rulings. But leaving the Court's rulings in place raises the possibility that future transactions under the Agreement, which conflict with the Court's ruling, could be challenged on the basis of that conflict. Moreover, the Water Master would be faced with the unnecessarily complicated task of having to determine whether the Settlement or the June 2005 Order governs a dispute.

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Another example of inconsistency between the June Order and the Settlement is the Court's choice of the "practicably irrigable acreage" (PIA) plus domestic need standard for quantifying Plaintiffs' reserved water right. The Settlement is not structured in terms of the PIA standard and was not based on determinations relating to the amount of arable land within the Case Area. Rather, based on independent considerations, the parties negotiated a unique division of the predicted maximum safe yield of the aquifer in combination with other issues on which there was mutual give and take. Likewise, the Court's domestic reserved rights ruling is inconsistent with the settlement solutions negotiated by the parties. Although the Court ruled that, as a matter of law, the Plaintiffs were entitled to a separate quantification of water in addition to PIA to support their domestic needs, the Court did not identify the precise methodology that would be used to quantify domestic needs. Significantly, the Settlement does not use a particular methodology for dividing the water between the Plaintiffs and the State of Washington; rather, the allocation of water and rules for acquisition of water rights were arrived at by negotiation and compromise, and those agreements provide a unique solution to the ground water conflicts within the Case Area.

The Settlement further differs from the June 2005 Order, and has the potential for future conflict in the absence of vacatur, in the handling of water claims of certain future landowners. As noted above, the settlement parties have agreed to eliminate seniority and to provide protections to all existing and many future water users. The Agreement further provides certain guidance for future transfers of a parcel of land but specifically and intentionally leaves the question of what law may apply when a parcel of land leaves Indian ownership in the future to be decided based upon the law that exists at the time of that future transfer. This is a sensible choice. Retention of the June 2005 ruling may require that the

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parties apply the law of the case as it was decided in 2005 to a land transaction that could occur ten, twenty, or fifty years from now, even if the law has developed in contrary ways at that point. Because this case only involves a portion of the Lummi Reservation, land transfer consequences in one part of the Reservation could differ from those in the balance of the Reservation.

One of the rulings in the June 2005 Order that is of utmost concern to some parties concerns the effect of transfers of land, with the potential for water not put to use to be forfeited to the State for reallocation with a junior priority. Because of the far-reaching implications of this ruling, those Parties believe that they must retain their appeal rights, and therefore are not in a position to agree to settle this case without vacatur of the Order. In similar circumstances, a California federal court acknowledged that fairness concerns required vacatur:

> Where, as here, the commission is faced with a choice between (a) terminating a particular enforcement action on terms that are fair to the parties involved, and (b) pursuing the action through the appellate system in order to remedy a district court decision that might significantly affect the Commission's ability to enforce the securities laws in other cases, the *Ringsby* criteria . . . as well as more general considerations of fairness, dictate that the decision should be vacated.

S.E.C. v. Trikilis, 1993 WL 43571 (C.D. Cal. 1993), at page 1.

V. SUMMARY AND CONCLUSION

For the reasons stated above, the Settling Parties ask this Court to approve the Settlement in its entirety and, consistent with the proposed agreement, to vacate its June 25 Order.

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Respectfully submitted this 2nd day of November, 2006.

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THE HONORABLE THOMAS S. ZILLY
Consideration Date: _____

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON AT SEATTLE

UNITED STATES, in its own right and on Behalf of the Lummi Nation, Plaintiff, LUMMI INDIAN NATION, Plaintiff-Intervenor, v. STATE OF WASHINGTON DEPARTMENT OF ECOLOGY, et al., Defendants.	Case No. C01-0047Z DECLARATION OF GENE KNAPP

I, GENE KNAPP, declare that I am the attorney of record representing the defendants known as the Defendant Homeowners in the above-captioned matter. I am over the age of 18 years, am competent to testify to the matters set forth below, and I have personal knowledge of those matters.

1. Extensive discovery regarding this case included 51 witness depositions taken between December 2002 and January 2005.

2. Exhibit 1 contains true and correct excerpts from the transcript of David Nazy's deposition taken July 1, 2004.

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3. Exhibit 2 contains true and correct excerpts from the transcript of Mark Shaffer's deposition taken April 29, 2004 (Volume I).

4. Exhibit 3 contains excerpts from the Lummi Peninsula groundwater investigation described in Exhibit 3.

I declare under penalty of perjury under the laws of the state of Washington that the foregoing is true and correct:

DATED this 30 day of October, 2006, at Bellingham, Washington.

BARRON SMITH DAUGERT, PLLC

By Gene Knapp
Gene Knapp, WSBA #2691
Attorney for Defendant Homeowners

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Exhibit 1

UNITED STATES DISTRICT COURT

FOR THE WESTERN DISTRICT OF WASHINGTON

AT SEATTLE

UNITED STATES, in its own right and on behalf of the Lummi Indian Nation,

Plaintiff,

LUMMI INDIAN NATION,

Plaintiff-Intervenor,

vs. C01-0047Z

STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY, et al.,

Defendants.

Deposition Upon Oral Examination Of

DAVID NAZY

July 1, 2004

601 Union Street, Suite 5000

Seattle, Washington

REPORTED BY: PEGGY FRITSCHY HAMILTON, RPR, CSR FRITSPMR422MB

Page 5, lines 20 – 25; Page 6, lines 1 – 13:

Q: Could you describe your educational background starting after high school?

A: Okay. Right after high school I went to Winona State University in southeaster Minnesota, got a bachelor's in geology. Immediately following that I went to graduate school at Portland State, got a master's in geology. I have had a lot of training. Soon after that I was hired with the Department of Ecology, and have had numerous trainings since that time on a variety of topics.

Q: Have you had any training or course work in issues pertaining to hydrology?

A: Yes.

Q: Again, what are those?

A: I have taken basic hydrogeology, hydrology courses, I have taken some courses in analysis of pumping test data;, groundwater modeling, I took some courses at grad school, and I have taken several trainings since then on groundwater modeling. Other courses related to sampling, data analysis, statistics.

Page 7, lines 23 – 25; Page 8, lines 1 – 2 and 7 – 16:

Q: You have noted that you spent a considerable amount of time working in the water resources department processing water rights applications in one form or another. Is that correct?

A: Yes.

...

Q: ...what exactly are your functions in connection with processing water rights applications?

A: One of our primary jobs is to address the relevant issues related to the application we are working on, and for new applications, there's four basic tests that need to be addressed for processing applications: Is water available for appropriation? Will the appropriation cause impairment to existing rights? Will the use be beneficial? And would it be detrimental to the public welfare?

Page 21, lines 6 – 25; Page 22, lines 1 – 4 and lines 17 – 19:

A: ...based on Aspect's data and my understanding of what that is, do I have concerns about saltwater intrusion on the peninsula?

Q: Yes.

A: Yes.

Q: Why is that?

A: Well, their data shows a lot of the information that I was already aware of about the peninsula.

Q: Could you be a bit more specific about that data and how it related to your conclusion?

A: The water elevations, the groundwater elevations on the peninsula are, throughout most of the peninsula are not much above sea level. There's also some water quality data that indicates there has been some intrusion on the peninsula. The hydraulic properties of the aquifer, the conceptual model, groundwater model results indicates the potential exists for over pumping the aquifer and causing seawater intrusion.

Q: Do you have an opinion with regard to whether or not that the work performed by Aspect Consulting was reliable work?

A: Based on what I reviewed, it seemed a reasonable representation of existing site conditions out there.

...

A: The overall, you know, conceptual model of the peninsula and, you know, the basic inputs and data they generated and their conclusions seemed reasonable to me.

Page 23, lines 19 -22:

Q: I understand that you do agree that with regard to the Lummi Peninsula as a whole the availability of groundwater resources is extremely limited?

A: Yeah, ...

Page 26, lines 9 – 21:

Q: Let me ask your opinion. What do you think about the conclusion of Aspect that the theoretical maximum safe yield is approximately 1,000 acre feet? Do you have an opinion on that?

A: Given the limitations of what we've got to use to estimate what the safe yield is and the methods that are used to come up with that, it seemed reasonable, yes. I don't know how

we would do a better job of estimating what that number would be other than a groundwater model, and that doesn't - - I'm not saying the result of the groundwater model is the answer. I'm saying the tool of using a groundwater model to make that estimate is probably one of the, the best thing you could probably do given what we've go to work with.

Page 27, lines 9 – 15:

Q: Do you agree with the next sentence on page 4, which says, Any future groundwater development should only be done after careful and thorough investigations that prove that water is available without causing impairment to existing rights or degradation of the aquifers? Do you agree with that statement?

A: Yes.

Page 31, line 25; Page 32, lines 1 – 8:

Q: Let me ask you. Why did you prepare this memo? In what context did you prepare this memo?

A: As stated on the first page in the second-to-the-last paragraph, "The objective is to develop a hydrologic inventory (water balance calculation) for the study area for present conditions and for those conditions that are projected to exist with full agricultural development. The ultimate objective is to estimate the safe sustainable yield of the groundwater resources (sic) within the study area."

Page 33, lines 15 – 25; Page 34, lines 1 and 7, and lines 8 - 15:

Q: First of all, I want to go maybe just to the ultimate conclusion first, and maybe ask some questions about that. But, looking down to page 26, there is a table which there's summary conclusions and then there's a table there. Let me just read the text before the table. It says, "Limited recharge, the subsequent limited water available for withdrawal, along with saltwater intrusion concerns, all limit groundwater development within the study area. The estimated current use within the study area is close to the low end of the estimated available groundwater suggesting that increases in groundwater withdrawals should be approached cautiously." Did I read that correctly?

...

A: I think the answer to your question was yes.

Q: Could you read the table and basically read what the table says here?

A: It's entitled table 11, summary of recharge, current use, and potential development. Groundwater recharge is 1,607 to 2,917 acre feet per year. Available groundwater, 26 percent of recharge would be 402 to 729 acre feet per year. Current use, 320 acre feet per year, and potential groundwater left for development, 82 to 409 acre feet per year.

Page 62, lines 19 – 25; Page 63, lines 1 – 2:

Q: If I understood your testimony earlier, you feel that your safe yield analysis and Aspect's are basically within the same range given the quality of the data and so forth?

A: Yeah.

Q: I realize yours is a little lower?

A: Right.

Q: Effectively you are talking about the same general ballpark?

A: I think so.

Page 69, line 6 – 9:

Q: Okay. So the whole area, then, it sounds like would be a red flag area or an area of concern for saltwater intrusion?

A: Well, yeah.

Page 129, lines 7 – 14:

Q: Is there also a concern regarding what happens to the aquifer overall if saltwater intrusion reaches a certain level; in other words, is it easy or difficult to reverse the process once the contamination has occurred?

A: I think in general once the contamination has occurred, it's hard to reverse the process, so, you know, our approach is to avoid the problem so we don't have to worry about that.

Exhibit 2

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON
AT SEATTLE

UNITED STATES, in its own right and on behalf of the Lummi Nation, Plaintiff, LUMMI INDIAN NATION, Plaintiff-Intervenor, -vs- STATE OF WASHINGTON DEPARTMENT OF ECOLOGY, et al., Defendants.	No. C01-0047Z

DEPOSITION UPON ORAL EXAMINATION OF
MARK EDWARD SHAFFER
VOLUME I

DATE TAKEN: Thursday, April 29, 2004

PLACE: 900 Fourth Avenue
Suite 2100
Seattle, Washington

REPORTED BY: Mary Mejlaender, CCR No. 2056

Vol. I, page 12, lines 16 – 23 (referenced Exhibit No. 1 is attached):

Q: (By Mr. Slater) Mr. Shaffer, could you identify what's been marked as Exhibit No. 1?

A: This is a letter from the Bureau of Indian Affairs to Associated Earth Sciences to my attention.

Q: And is that the letter that triggered the contract process involving your work in this case?

A: I can't answer that definitely. It certainly is a key part of that process.

Vol. I, page 13, lines 3 – 11 (referenced Exhibit No. 2 is attached):

(Exhibit No. 2 was marked.)

Q: (By Mr. Slater) And Mr. Shaffer, was Exhibit - - what's marked as Exhibit No. 2 something that you submitted in response to the letter that you received which has been marked as Exhibit No. 1?

A: It would appear so. Exhibit No. 2 and what I - - what I see at a glance, does not specifically reference the letter that is Exhibit No. 1, but it does appear to respond to it.

Vol. I, page 31, lines 15 – 24 (referenced Exhibit No. 8 is attached):

(Exhibit No. 8 was marked.)

Q: (By Mr. Slater) Mr. Shaffer, take a look at Exhibit 8. That indicates that as of November 26, 2002 the total contract amount on contract CMP000563 had been increased to $1,166,265, and that your total invoices to date were $967,901.65. Is that $1,166,000 figure the result of a series of contract modifications that occurred from July of '97 up through 2002?

A: I believe so, yes.

Vol. I, page 33, lines 13 – 18 (referenced Exhibit No. 9 is attached):

(Exhibit No. 9 was marked.)

Q: (By Mr. Slater) Mr. Shaffer, looking at what's been marked as Exhibit No. 9, is that your proposal relative to the Department of Justice contract for work on this case?

A: Yes, it is.

PB1A002 5229

United States Department of the Interior

TAKE PRIDE IN AMERICA

IN REPLY REFER TO: Contracting

BUREAU OF INDIAN AFFAIRS
Portland Area Office
911 N.E. 11th Avenue
Portland, Oregon 97232-4169

June 24, 1997

Associated Earth Sciences, Inc.
179 Madrone Lane North
Bainbridge Island, Washington 98110
Attention: Mr. Mark Shaffer

Dear Mr. Shaffer:

The United States is interested in obtaining the services of Associated Earth Sciences, Inc. to provide a ground water investigation in the Lummi Peninsula area of the Lummi Indian Reservation under the provisions of FAR Part 6.302-3 Industrial mobilization; engineering, developmental or research capabilities or expert services. This work will be done to support ongoing water rights negotiation and litigation services for the United States in association with the negotiations of the Lummi Reservation trust water right with the State of Washington. Since your firm is already qualified as an expert witness in this issue the work will be conducted under a fixed price contract with the Bureau of Indian Affairs entered into under FAR Part 6.302-3(a) (2) (iii), expert witness services in current or anticipated litigation.

The basic objectives of the work is to characterize the aquifers on the Lummi Peninsula Area of the Lummi Indian Reservation and to ultimately develop a calibrated numerical ground water model. The calibrated numerical ground water model may be used in future investigations to assess the quantity of water that can be extracted on a long-term basis without incurring undue adverse impacts and for the development of an overall ground water management strategy. Please prepare a Scope of Work and cost estimates for the proposed work and return it to the Contracting Officer by June 27, 1997.

The scope should addresses the issues of aquifer identification, aquifer capacity for water supply, and ground water quality, particularly as regards natural and induced salinity. Although the scope developed should be relatively specific, provision should be allowed for modification of the program based on interim findings and results, in consultation with the government and the Tribe. All field work for this project should be completed in one year.

Project deliverables that will be required from this initial work will include, but may not be limited to, the following:

- a comprehensive water well database;
- a water quality database;

Shaffer
EXHIBIT NO. 1
4/29/04

PB1A002 5230

- on-reservation weather information;
- geologic and hydrogeologic cross sections;
- potentiometric surface maps;
- well hydrographs;
- aquifer specific capacities map;
- chloride concentration maps;
- analysis of isotope data for the purposes of age dating;
- trilinear diagrams;
- stream/ditch gauge locations and discharge;
- spring locations and discharge;
- hydrologic unit (surface water) maps;
- aquifer hydraulic test data, analysis and interpretation;

- a numerical ground water model with documentation of:
  - conceptual model development;
  - model construction;
  - model calibration;
  - sensitivity/uncertainty analyses; and,

- draft and final reports including all basic field and modeling data, tables, figures, and maps in hard copy and electronic format.

The deliverables of this study should be sufficiently detailed and comprehensive to support water rights litigation. The contractor's work proposal shall indicate how the work to obtain the deliverables shall be done. The contractor's proposal shall provide sufficient detail that the method by which the work will be done and the techniques, such as geophysical studies, drilling, and document research, can be evaluated by the government for completeness.

The United States intends to give a copy of the contractor's work proposal to the Lummi Tribe for their evaluation and comment. Please prepare a separate listing of costs for the work, that is not included in the work proposal, for the use of the Contracting Officer. If you include any proprietary information or confidential information in the proposal please prepare a separate enclosure and mark it "CONFIDENTIAL". If you have any questions regarding this request please contact Mr. Robert Fenton, Area Hydrologist, at (503)-231-6927.

Sincerely,

Contracting Officer

June 27, 1997

SCOPE OF WORK
GROUND WATER INVESTIGATION — LUMMI PENINSULA
LUMMI INDIAN RESERVATION

This document provides a scope of work for a ground water investigation in the Lummi Peninsula area of the Lummi Indian Reservation. A cost estimate is provided as a separate attachment. The scope addresses the basic issues of aquifer identification, aquifer capacity for water supply, and ground water quality, particularly as regards natural and induced salinity. Although the scope developed herein is relatively specific, provision should be allowed for modification of the program based on interim findings and results, in consultation with the government. The deliverables of this study will be sufficiently detailed and comprehensive to support water rights litigation.

PROJECT OBJECTIVES

The basic objectives of this scope of work are to characterize the aquifers on the Lummi Peninsula and develop a calibrated numerical ground water model. The calibrated numerical ground water model may be used in future investigations to assess the quantity of water that can be extracted on a long-term basis without incurring undue adverse impacts and for the development of an overall ground water management strategy. Project deliverables will include the following:

- monthly status reports
- a technical memorandum on the hydrogeologic conceptual model including:
  - a comprehensive water well database;
  - a water quality database;
  - geologic and hydrogeologic cross sections;
  - potentiometric surface maps;
  - well hydrographs;
  - aquifer specific capacities map;
  - chloride concentration maps;
  - analysis of isotope data for the purposes of age dating;
  - trilinear diagrams;
  - a water budget;
  - on-Reservation weather information (climate data);
  - stream/ditch gauge locations and discharge;
  - spring locations and discharge;
  - hydrologic unit (surface water) maps;
  - aquifer hydraulic test data, analysis and interpretation;

Shaffer
EXHIBIT NO. 2
4/29/04

- a numerical ground water model with documentation of:
  - conceptual model development;
  - model construction;
  - model calibration;
  - sensitivity/uncertainty analyses; and,
- draft and final reports including all basic field and modeling data, tables, figures, and maps in hard copy and electronic format.

SUMMARY

The scope is divided into two principal phases, which can be conducted over a two-year period:

- Phase I — Hydrogeologic Conceptual Model
- Phase II — Numerical Ground Water Model

Phase I includes the collection and analysis of physical data (geologic, geophysical, meteorologic, surface water, and ground water) and development of a conceptual model. This work would be conducted predominantly during the first year of the investigation with ongoing monitoring continuing into the second year. It is assumed that the investigation will be coordinated with the Lummi Tribe for sharing of data and to obtain access to tribal and private lands.

Phase II is development of a ground water computer model to simulate the ground water flow field in three dimensions and to evaluate the availability of ground water and the impacts of existing and future wells. The model will incorporate salinity and will assist in predicting potential changes to the flow system with time and/or with variable well configurations and pumping rates. The ground water modeling would phase would be conducted during the second year. In addition to these principal project phases, report and meeting phases are included.

TASK DESCRIPTIONS

The following tasks build on current working hypotheses to define geologic conditions on the peninsula and to develop a hydrogeologic conceptual model. In a second phase, aquifer yields and the general depths and locations of wells providing a safe yield without ground water degradation will be developed through a ground water model specifically designed to model the chloride transport and density flow characteristics of sea water. Simulation runs to test specific scenarios for litigation support are not included in this scope, but the model will be constructed to perform this function as may be required in the future.

Following are descriptions of each task included in the proposed scope of work. As discussed below under the detailed write-up of each task and supporting subtasks, several assumptions have been applied to develop this scope and cost estimate.

PHASE I — HYDROGEOLOGIC CONCEPTUAL MODEL

Under this phase, physical data will be collected and analyzed to develop a conceptual model of the ground water flow system for the Lummi Peninsula. This phase has been divided into the following major subtasks:

- Geologic Investigation
- Surface Water Investigation
- Hydrogeologic Investigation
- Technical Memorandum

Task 1 — Geologic Investigation

Subtask 1.1 - Update Existing Geologic/Hydrogeologic Data

Existing geologic/hydrogeologic data will be compiled under this subtask. This includes well logs and water rights information on file with the Lummi Nation, Washington State Departments of Ecology and Health (WDOE and WDOH), and Whatcom County Health Department; and basic geologic and geophysical information and reports on the Lummi Indian Reservation including state (WDOE and Washington State Department of Natural Resources [WDNR]) and USGS data and reports, consultant reports, and any applicable Master's and Ph.D. theses. The data will be entered into a database that will contain basic geologic information (depths and thicknesses of hydrostratigraphic units), well locations and completion data, well depths, yields, producing units, and screened/perforated intervals. Much of the basic data compilation has been completed. A quality assurance/quality control (QA/QC) plan for validating existing data and for all data collected during this investigation will be developed. QA/QC checks will be performed on the basic data collected under this task.

Subtask 1.2 - Develop Geologic/Hydrogeologic Database/Cross Sections

The USGS has compiled location information, basic well completion data, hydraulic characteristics and water level data for many wells on the Lummi Peninsula into a database. The Lummi Tribe has developed a well database that integrates the USGS data and has improved locational data. These databases will be used as the starting point under this task to develop a comprehensive geologic/hydrogeologic database in Microsoft Access format. A quality assurance/quality control check will be performed on all data prior to entering it into the database. Questionable data will be flagged and/or rejected. Where appropriate, the data will be qualified based on the limits of uncertainty (e.g., elevation data).

Geologic interpretation of well log data will be performed. Geologic interpretations will include assigning described formations on driller's logs to hydrostratigraphic units and making regional geologic correlations. Geologic data will be compiled into graphic logs using a log plotting software program such as Logger v.5 developed by Rockware. Graphic and descriptive formats used by several other tribes in Washington including the Suquamish, Swinomish, and Chehalis will be adapted to develop conceptual models of geologic and aquifer conditions. Computer input

consists of basic quantitative and descriptive data obtained from well logs and other data that have measured over depth and converts the data to a graphic strip log. Each log will have a header containing locational data (x, y, z), which can be used to create computer-generated cross sections.

Basic descriptive geologic information from driller's logs and test pit logs will be input. From this data, a series of stick-log cross sections will be developed. On the basis of these stick-log cross sections and surface mapping (Subtask 1.3), geologic interpretations and regional stratigraphic correlations will be made. Basic descriptive data will be entered essentially as it appears on the driller's log so no geologic information is lost in the process.

From the regional stratigraphic correlations, the tops and bottoms of geologic units will be input into the Access database for each well log. The hydrostratigraphic units in this database will be used for input into the numerical ground water model in Phase II. The geologic database will be in a format compatible for integration into a Geographic Information System (GIS) under subtask 1.5.

Subtask 1.3 - Field Mapping/Test Pit Explorations

Surface geologic mapping of the Lummi Peninsula has been performed by Easterbrook (1963 and 1976), and Palmer (1977). These mapping efforts were included as part of regional mapping studies and are both general and outdated in stratigraphic terminology. Detailed field geologic mapping of the peninsula will be conducted to supplement and refine existing mapping. Test pits will be excavated using a backhoe in selected locations throughout the peninsula, as necessary, and as access permits. One week of backhoe time for test pit excavations and one week of time for mapping exposures in the field has been assumed. Samples will be collected in this task and under Subtask 3.1 for clast counts of lithologic types to assist in geologic identification of the units.

Test pit locations will be field-staked and plotted on aerial photographs and topographic maps using standard compass and tape survey techniques.

Unpublished regional and local geologic investigations in progress will be compiled under this task. We will meet with geologists and geophysicists who have worked in the region including personnel from Canadian federal and provincial agencies, USGS, and Western Washington University. A field tour will be conducted with appropriate parties prior to and subsequent to our mapping. The services of an expert in local stratigraphy will be retained to discuss geologic conditions prior to mapping and to discuss our findings. Time has also been included for post-field-work interaction with the USGS and transfer of data to them.

Subtask 1.4 - Geophysics

Geophysical techniques to be implemented in this investigation include electrical resistivity imaging (ERI) and time-domain electromagnetics (TDEM). ERI will be performed to assist in evaluation of salinity concentrations and gradients on the peninsula. This method should be effective to ground water depths as great as 60 feet. Approximately 4,000 feet of surface resistivity profiles has been assumed. Transect lines will be identified in Subtask 3.4 following evaluation of existing chloride data. The locations of the transects will focus on defining salinity gradients

in areas where detailed chloride is unavailable and in areas where salinity has increased due to pumping (for example, Gooseberry Point).

Surface resistivity was used successfully in 1974 to delineate major stratigraphic units to depths of approximately 200 feet (Shannon & Wilson, 1974). Since that time, several advancements have occurred in resistivity technology including the use of TDEM. TDEM offers the advantage over conventional surface resistivity techniques in providing greater vertical and lateral resolution data from greater depths. TDEM will be used to define stratigraphic changes with depth. Approximately 1,000 feet of TDEM profiling has been assumed.

Subtask 1.5 - Hydrogeologic Maps and Cross Sections/Subsurface Mapping

A well location map, structure contour maps, isopach (unit thickness) maps, water-table elevation maps, geologic cross sections, and salinity maps will be developed under this task using data compiled in Subtasks 1.1 through 1.4 and from the subsurface exploration program in Subtask 3.2. Selected maps and sections of important geologic and/or hydrologic features will be developed from the database (Subtask 1.2) and entered into ArcInfo GIS for final presentation. Cross sections will be finalized under this task and displayed in AutoCAD format.

The Lummi Tribe has entered well locations and property ownership into their GIS system. It is assumed that these GIS files will serve as the starting point for GIS displays.

Task 2 — Surface Water/Hydrologic Investigation

Subtask 2.1 - Water Budget Parameters

Under this subtask, the following water budget parameters will be evaluated:

- precipitation
- potential and actual evapotranspiration
- soil moisture holding capacity
- runoff
- recharge

Runoff input to the water budget will be estimated from surface water gauging under Subtask 2.3. The final output of the water budget will be an estimate of ground water recharge for the peninsula area. Precipitation will be determined using direct averaging or the normal-ratio method, using data collected at the Lummi Indian Reservation and correlating it to Bellingham and other nearby precipitation gauges with a 30-year or longer period of record. Results of this analysis will be compared to results determined using the Thiessen polygon method and published isohyetal contours.

In addition to data collected at existing off-reservation climatological stations, three climatological stations will be established on the reservation. Each of these stations will automatically measure and recorded the following conditions:

- wind speed/direction
- temperature and relative humidity
- barometric pressure
- precipitation (as rain and snow)

One of the three stations will also be equipped with a pyranometer for measurement of short wave solar radiation. The stations will be located based on evaluation of rain data at existing off-reservation locations. Rain and snow will be measured using an electric rain/snow gauge, which requires a 115-volt power source, to be provided by the Tribe. This task also includes monthly visits to download data, to be conducted in conjunction with Subtasks 2.3, 3.3 and 3.4.

Available methods will be researched for evaluating evapotranspiration in coniferous areas including recent work by the USGS at the University of British Columbia, and the most suitable method will be applied. The water-holding capacity of the soil will be researched through existing soil surveys of the Lummi Indian Reservation and through descriptive data obtained from the test pit explorations in Subtask 1.3.

Subtask 2.2 - Surface Water/Spring Inventory

This task can be effectively performed in conjunction with surface geologic mapping in Subtask 1.3. Springs will be mapped along accessible beaches and at the break in upland terraces. Spring discharge will be estimated by digging out the spring and taking volumetric flow measurements. If volumetric measurements are not feasible, flow will be estimated using an impeller-type flow meter where the spring discharge is sufficiently concentrated. For areas where spring flow is dispersed, visual estimates of spring discharge will be made. Spring discharge estimates will be used in the water budget analysis as well to evaluate ground water discharge points, flow paths and flux.

Streams and ditches will also be located under this task. Springs and surface water features identified in this task will be field-staked and located using a Global Positioning System (GPS). Access permitting, a reconnaissance will be conducted of each of the three ephemeral streams indicated on the USGS topographic map. These include the stream in Section 25 and streams heading in wetlands in Section 13 and 18.

Subtask 2.3 - Stream Gauging

Surface water discharge will be gauged under this task. Streams and ditches identified in Subtask 2.2 with sufficient flow for gauging will established as surface water gauging points to develop data on ground water discharge to surface water and on the runoff characteristics. Based on review of the USGS topographic sheet of the peninsula, the unnamed stream in Township 39 North, Range 1 East, Sections 13 and 14 will likely require gauging. Staff gauges will be established at appropriate surface water gauging points and a stage-discharge relationship will be developed. Gauging will be performed for a one-year period under this task and continued for an additional year under Phase II.

Subtask 2.4 - Hydrologic Maps

A hydrologic unit map will be prepared in GIS format under this subtask. The Tribe's GIS mapping will serve as the starting point for this map. Any springs or surface water features identified as part of Task 2 will be added to this map. Well withdrawals will be estimated on this map.

Task 3 — Hydrogeologic Investigation

Subtask 3.1 - Install Test Wells

Ground water monitoring data collected to date has focused on ground water levels and chloride concentrations in wells located in the coastal areas of the peninsula. Similarly, most of the geologic data has been obtained from well logs that are largely concentrated along the coastal regions where development is greatest. With the exception of a few logs, most basic geologic data is derived from driller's logs rather than geological descriptions. Hydraulic test data are mostly limited to short-term tests performed by drillers, which typically report stabilized drawdown. Important exceptions to this include work done by the USGS in the Bel Bay area, where controlled pump tests were performed. In addition, the deepest wells on the peninsula are less than 300 feet and do not fully penetrate the aquifer. As such, little detailed geologic and hydraulic data exists on the peninsula.

A series of 6-inch-diameter monitoring wells will be installed using air-rotary or cable-tool equipment to better define geologic and hydraulic conditions on the peninsula. The final locations of these wells will be based on the geologic/hydrogeologic data compiled and evaluated in Task 1. For planning purposes, the following is assumed: one well will be installed to a maximum depth of 400 feet; two wells to a maximum depth of 200 feet, and one well to a maximum depth of 100 feet. The deep well will explore the base of the known aquifers and the potential for a deeper aquifer. The 200-foot wells will provide important geologic data and ground water monitoring points for the peninsula interior. The 100-foot well will monitor in closer proximity to the coastal area and will focus on an area of pumping-induced saltwater intrusion such as Gooseberry Point.

Bid specifications will be developed and the services of licensed well driller will be subcontracted. Each boring will be logged by a geologist experienced with geologic conditions in Whatcom County. Relatively undisturbed drive samples will be collected at approximate 20-foot intervals. Samples and drill cuttings will be carefully scrutinized for wood and/or peat, and up to samples will be submitted for Carbon-14 age-dating. Lithologic clast analysis will be performed on selected samples to assist in geologic classification of units. Glacial and interglacial units should be differentiated by this technique. Specific conductance, pH, and temperature will be monitored in each water-bearing zone during drilling.

Up to a total of 24 samples will be collected for grain size analysis for use in well screen design. Wells will be completed with a nominal 6-inch-diameter, stainless steel, wire-wrapped, telescope screen installed with a conventional K-packer. A 10-in. steel protective casing with a locking cap will be installed over each well. Each well will be developed until it is relatively free from turbidity and silt through a combination of surging and airlifting.

All drilling will be coordinated with the Tribe. Well completions will meet the State of Washington's Minimum Standards for Construction and Maintenance of Wells (Chapter 173-160 WAC) and any additional special Tribal regulations which may exist.

Subtask 3.2 - Aquifer Testing

Hydraulic testing will be performed on all wells to develop an understanding of the hydraulic characteristics of the sand and gravel unit and the interconnection of aquifers to sea water. At least two selected wells will be hydraulically tested for a 24-hour or longer period. During each pump test, water levels, temperature, pH, specific conductance, and chloride levels will be monitored in the pumping well and each observation well.

Hydraulic characteristics of hydraulic conductivity, storage coefficient, and leakage determined from the pump test will be input into the ground water model in Phase II. Results of the pump test will also serve as important points for model calibration during transient simulations.

Subtask 3.3 - Fluid Levels

Water levels in selected Tribal wells on the Lummi Peninsula area will be monitored on a full-time basis using data loggers. Up to six wells on the peninsula will be fitted with data loggers to provide approximately hourly measurements of water levels, some of which are assumed to be test wells installed in Subtask 3.1. Wells equipped with continuous water level recorders provide factual information on hydrogeologic conditions, direct insight into recharge characteristics, tidal influence, and irrefutable data points for model calibration. The data loggers will be installed for a minimum one-year period and maintained and downloaded on a monthly basis by a technician from AESI.

Subtask 3.4 - Ground Water Quality

Existing water quality databases from the Tribe and the USGS will be reviewed under this task and a comprehensive database will be constructed. Water quality will also be checked for completeness and consistency with WDOH records. Each test well will be monitored for chloride on a monthly basis. Also under this task, up to 10 chloride samples will be split with the Tribe for QA/QC purposes.

Subtask 3.5 - Isotope Studies

Under this task, ground water samples will be collected at up to 10 locations to evaluate relative age dates for ground water by measuring naturally-occurring isotopes. The measurements will include tritium concentrations and deuterium and oxygen isotope ratios. The tritium dating will assist in determining the residence time of ground water within different hydrostratigraphic units and will provide a mechanism for determining ground water flow paths. Wells and springs identified for sample collection will be determined after completion of the geologic cross sections in Task 1 and spring inventory in Task 2.

In addition to isotope analysis, major cations and anions will be analyzed at these locations. Analysis of major ion data will permit grouping of ground water types based on chemistry. This analysis provides insight into ground water flow patterns.

Subtask 3.6 - Hydrogeologic Maps and Cross Section

Hydrogeologic maps developed during Subtask 1.5 will be refined and additional maps will be developed based on the results of Subtasks 3.1 through 3.5. New maps to be developed include:

- aquifer specific capacities/potential well yields
- potentiometric surface maps for each aquifer for various years
- chloride concentrations for each aquifer for various years
- trilinear diagrams displaying major ion data
- other water quality parameters determined to be relevant during the investigation

Maps will be displayed in GIS format.

Task 4 — Technical Memorandum on Hydrogeologic Conceptual Model

This task includes data analysis and reporting for the investigation. A conceptual model of the ground water flow system will be developed under this task, based on the data collected and analyzed under Tasks 1 through 3. A water budget analysis of the Lummi Peninsula area will be developed under this task. The report will include basic geologic, geophysical, geochemical (isotope studies and water quality), surface water, and ground water monitoring data.

PHASE II — NUMERICAL GROUND WATER MODELING

The output from Phase II will be a calibrated ground water computer model of the Lummi Peninsula. It should be noted that simulations are not included in this scope of work.

Also included in the Phase II scope of work is continued stream gauging, fluid level measurements and chloride monitoring for a one-year period.

Task 1 — Conceptual Model Development

Based on the conceptual model of the ground water flow field developed in Phase I, a three-dimensional model for the project area will be developed for the simulation of steady-state and transient ground water flow conditions. The conceptual model will be adapted to a numerical model. A grid orientation and sizing will be determined for the study area. The model domain will incorporate the peninsula area south of the Nooksack River. Hydrogeologic conditions are then developed on a coordinate system for model input. This includes determining the number of geologic layers and associated distribution of hydraulic properties within each layer, assigning boundary conditions for each layer, and establishing recharge in the model framework.

Task 2 — Model Construction

Modeling of the Lummi Peninsula must accommodate density flow to accurately model sea water intrusion. Appropriate software could include the SEAWAT software developed for flow simulation under conditions of varying salinity, developed by S.S. Papadopulos & Associates, Inc. SEAWAT is an adaptation of the USGS finite difference model, MODFLOW (McDonald and Harbaugh, 1988) and MT3D, with a number of modifications to couple salinity to variable density.

This task includes assigning *x-y-z* coordinates to input parameters, extrapolating between the coordinates and inputting the data into the model framework.

Task 3 — Model Calibration

Under this task, model input parameters are adjusted in areas of uncertainty to obtain the best match with measured head and salinity data. This includes varying boundary conditions, hydraulic conductivities and recharge rates for the various geologic units within a range of reasonable values for the area. Output from the model calibration process includes both graphical representations and tabulated listings of measured water level elevation and salinity data versus predictions by the model.

Task 4 — Sensitivity/Uncertainty Analysis

Model sensitivity and uncertainty will be determined using deterministic and statistical approaches, respectively. Under the deterministic approach, model input parameters that are known with only limited certainty will be varied to establish the sensitivity of the model to the possible variation in these parameters. Following calibration, additional runs are made varying input parameters within the range of best estimates and determining the effect on the model. For example, estimates of transmissivity may be varied within the range of possibilities and the effect on transport velocities determined. During the sensitivity analysis each of the changes must be taken in the context of the effect on model calibration.

Uncertainty analysis will be performed to determine statistical confidence intervals for input parameters. This can be effectively accomplished using parameter estimation programs such as PEST or MODFLOWP, which compute statistics for optimum fit values. Parameter estimation programs are run in conjunction with the subjective calibration process in Task 3. Input to the parameter estimation algorithms consist of upper and lower bounds for a given parameter based on field-measured data. Output from the parameter estimation algorithm is the optimum value that gives the best fit to measured calibration points and the upper and lower confidence intervals associated with that value.

Task 5 — Continued Monitoring

Under this task, monitoring of climatological conditions, surface water flows, fluid levels, and chloride concentrations initiated in Phase I under Subtasks 2.1, 2.3, 3.3, and 3.4, respectively, will be continued for an additional year. This work includes monthly site visits to read staff

gauges, download weather station and water level data loggers and perform routine data logger maintenance (i.e., check batteries, calibration and change desiccant packs). Entry of data obtained under this task is also included.

Task 6 — Prepare Draft Report

A draft report summarizing the findings of Phases I and II will be prepared. This report will include all basic data obtained as part of this investigation in an appendix and will include appropriate maps and tables in hard copy and electronic format.

Task 7 — Prepare Final Report

Under this task comments on the draft report will be addressed and a final report will be prepared.

PHASE III — PROJECT MANAGEMENT AND MEETINGS

Project management will include general project administration, preparation of monthly project status reports to BIA, subcontractor coordination and management, and budget tracking and scheduling. This task also includes participation in up to eight meetings with BIA in either Portland or Bellingham to discuss project progress and findings.

This program can be conducted as a two-year program or as two one-year programs. Therefore, project management has been broken down into separate tasks for Phases I and II.

MARK E. SHAFFER, P.E., R.G., C.HG.
Principal Geological Engineer/Hydrogeologist

Aspect consulting
IN DEPTH PERSPECTIVE

EDUCATION

Gp.E., Geophysical Engineering, Colorado School of Mines

M.S., Geological Engineering, Colorado School of Mines

Post-Graduate Studies, Civil Engineering, University of Colorado

PROFESSIONAL REGISTRATIONS

Registered Professional Engineer
State of Arizona
State of Colorado
State of Idaho
State of Montana
State of Nevada
State of New Mexico
State of Oregon
State of Utah
State of Washington

Registered Professional Geologist
State of California
State of Oregon

Certified Engineering Geologist
State of California
State of Oregon

Certified Hydrogeologist
State of California

PROFESSIONAL ASSOCIATIONS

American Geophysical Union
American Society of Civil Engineers
American Water Resources Association
Geological Association of Canada
Geological Society of America
National Groundwater Association
Soil Science Society of America

SUMMARY

Mr. Shaffer has provided technical assistance and litigation/negotiation support since 1973. He has extensive experience and education in both hydrogeology and engineering, providing a comprehensive understanding of the issues associated with water resource exploration, development, water resources management, water rights, and well design. Mr. Shaffer has conducted and managed regional and site-specific ground water resource evaluations, stream augmentation/mitigation plans, aquifer testing and analyses, water quality evaluations, basin geohydrology evaluations, and design of wells, ground water monitoring systems, seepage analyses, drainage/dewatering systems, water rights strategy, and ground water management plans. He has extensive experience in western Washington and the western United States and has managed and provided oversight on drilling and testing of numerous production wells.

REPRESENTATIVE PROFESSIONAL EXPERIENCE

WHITE RIVER PROJECT
Pierce County, Washington

As part of a multi-phased water right transfer project concerning Lake Tapps and the White River in Pierce County, Washington, Aspect Consulting researched the identities and locations of downstream water right users. Research included determining a geographic search range for all surface and ground water users downstream that might be affected by a change in water use. Through inquiries with the Southwest Region office of the Washington State Department of Ecology, all downstream surface water users on the White and Puyallup Rivers, as well as ground water users within the floodplains of these rivers, were identified using the Water Right Application Tracking System (WRATS) database. Resulting entries were divided into main categories of surface water and ground water rights. These categories were further subdivided to distinguish between water right certificates, applications, permits, and claims. After determining total certificated allocations on the White and Puyallup Rivers, including statutory minimum instream flows, USGS gauging station records were accessed to accurately quantify yearly and summer average and low flows for comparison with water rights. Changes in watershed hydrology were analyzed to differentiate climatic versus human influences. Various diversion and storage scenarios were evaluated to assess augmentation requirements for complying with minimum instream flows and for mitigating TMDLs for pH and dissolved oxygen on the White and lower Puyallup Rivers.

GRAYSMARSH HYDROGEOLOGIC INVESTIGATION
Sequim, Washington

Comprehensive hydrogeologic investigation for an approximate 1.5-square-mile privately owned marsh/agricultural complex located in Sequim, Washington. The City of Sequim relocated their wellfield from a location adjacent to the Dungeness River where it was in direct hydraulic continuity, to a location in the Gierin Creek basin. Graysmarsh was concerned over impacts from the well relocation of the wellfield and from measures to line leaking irrigation ditches that recharge the shallow aquifer. An intensive stream gauging effort was implemented including gauging of the tidally influenced marsh. Aspect Consulting developed appropriate methods for gauging at 13 surface water locations and selected wells on the property. Impacts of the wellfield on the marsh were determined analytically. Worked closely with Graysmarsh fisheries biologist to determine areas that were more sensitive to reduced flow and required more detailed gauging.

DUCK VALLEY INDIAN RESERVATION
Nevada-Idaho

This project is a comprehensive inventory and management study of water resources on the Duck Valley Indian Reservation in Idaho-Nevada in conjunction with Snake River adjudications. Work to date has included inspection, geophysical logging and pump

NOTE:
Portion of Shaffer Deposition
Exhibit 9

Exhibit 3

Aspect consulting
IN-DEPTH PERSPECTIVE

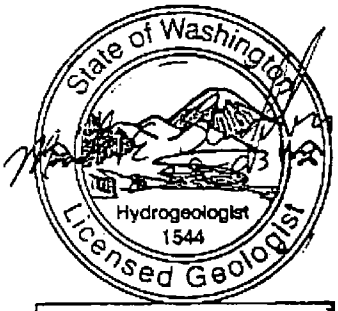
LUMMI PENINSULA GROUND WATER INVESTIGATION

Lummi Indian Reservation, Washington

Prepared for: Bureau of Indian Affairs

Project No. 970042 • February 28, 2003

Aspect Consulting, LLC



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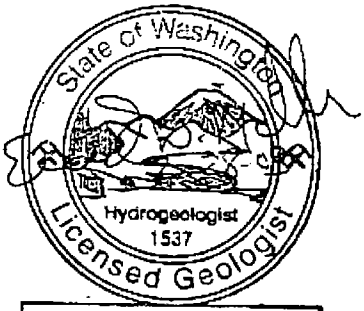

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9.0 CONCLUSIONS

Following are the major conclusions of the Lummi Peninsula Ground Water Investigation:

1. Ground water is the only source of water on the Lummi Peninsula that can be developed for potable domestic supply without treatment.

2. Precipitation falling on the Lummi Peninsula provides the only significant source for ground water recharge on the Peninsula.

3. Wells must be drilled to or below sea level to penetrate the main aquifer system sufficiently to provide adequate yields for community domestic supply. While shallow dug wells and springs were used historically for water supply on the Lummi Peninsula, the shallow, perched aquifer system supplying these sources is not suitable for contemporary community domestic supply.

4. The safe yield of wells penetrating the main aquifer system on the Lummi Peninsula is constrained by well locations, by geologic conditions and by the occurrence of saline water, which is believed to underlie all parts of the Peninsula. "Safe yield" is defined in this study as the maximum practical pumping rate from a representative array of wells, which can be sustained indefinitely without incurring concentrations of chloride ion that consistently exceed the statutory Secondary Maximum Contaminant level of 250 milligrams per liter (mg/l).

5. The theoretical safe yield of the main aquifer system on the Lummi Peninsula was computed using a numerical model to be approximately 1,000 acre-feet per year. The practicable safe yield will be less than the theoretical safe yield, due to practical limitations on well locations.

6. The safe yield will be further diminished if, in order to minimize risks of seawater intrusion, the water resource manager uses a chloride concentration criterion less than 250 mg/l for restricting well locations or curtailing pumping rates. Such a criterion has been promulgated by the Washington Department of Health.

THE HONORABLE THOMAS S. ZILLY

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON AT SEATTLE

UNITED STATES, in its own right and on behalf of the Lummi Nation, Plaintiff, LUMMI NATION, Plaintiff-Intervenor, v. STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY, et al., Defendants.	NO. C01-0047Z **Ann Newton Stark Declaration**

Ann Newton Stark, under penalty of the perjury laws of the state of Washington and the United States, states:

U.S. Department of Justice
James B. Cooney
601 D Street, N.W.,
Room 3017
Washington, DC

I am over the age of eighteen, competent to be a witness in this matter, and make this statement of my own personal knowledge.

I am employed by the Lummi Nation as the Geographic Information Systems (GIS) Coordinator. My education and training for this position includes:

_ Master's degree in geography with a minor in cartography from Oregon State University.

_ Nine years professional experience in the field of GIS

_ Professional certification (GISP) through the GIS Certification Institute.

GIS is a computerized system of depicting spatial information such as land forms, natural and man-made physical features, or parcel boundaries and their related tabular information such as ownership information or other attributes. The various sets of data are organized in "layers". A trained GIS operator can select different layers for display on a map, depending upon the type of information operator has been asked to depict or produce. For example, a map can be produced that shows only roads that are paved, only streams of a certain size, only topography, only parcels within a certain distance of another feature, or any combination of features. In addition, an operator may select a given portion of the geographic area and the system will produce a variety of information regarding that selected area. GIS systems are widely used by government agencies, including state and local governments, federal agencies and Indian tribes. The Lummi GIS contains data from many sources. Fee land ownership information is obtained from Whatcom County. Trust or restricted land information is obtained from the records of the Bureau of Indian Affairs and tribal records.

I have included in the Lummi GIS a depiction of the boundary of the "Case Area" for the

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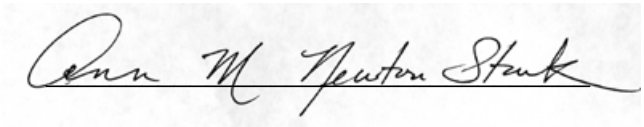
Lummi Peninsula groundwater litigation. The boundary description was supplied by the United States. The GIS system calculates the total acreage within the Case Area boundary as 6286 acres. Whatcom County Assessor's data included in the GIS as of July 3, 2006 indicates that 1245 acres in the case area are owned by persons who are not members of the Lummi Nation. The 1245 acres is approximately 19.8% of the total Case Area acreage. The remaining acreage in the Case Area is owned in a mixture of trust, restricted fee and unrestricted fee status by the Lummi Nation, Lummi members, or other Indians for whom the United States exercises a trust responsibility, according to the data in the GIS system. The majority of the non-Indian homes in the Case Area are located on parcels that are smaller than 2.7 acres in size.

DATED at the Lummi Reservation, Washington, this 12th day of October, 2006.



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